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video gaming machine having a touch screen for player interaction

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**(12) PATENT ABSTRACT (11) Document No. AU-A-50576/96**  
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(54) Title  
**VIDEO GAMING MACHINE HAVING A TOUCH SCREEN FOR PLAYER INTERACTION**

(51)<sup>6</sup> International Patent Classification(s)  
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(57)

The invention provides a video gaming machine (10) having a touch screen display (12) and a control system which displays game control touch areas and player data input (78) and message areas (76) on the touch screen display (12) to integrate game control and player tracking functions. The data input areas (78) include touch sensitive key areas (88) for inputting alphanumeric information. The message areas (76) can include both alphanumeric text and graphics messages. The control system groups the message (76) and data input key areas (78) in a logical fashion to create a user-friendly graphical interface to the gaming machine data system. In another aspect of the present invention, a second group of key areas (80) is provided which display graphical icons (82a-e) representing services available to the player.

**CLAIM**

1. A video gaming machine comprising:  
a touch-sensitive video display; and  
control means operatively connected to said touch-sensitive video display for displaying games and for displaying a message area and a first touch-sensitive key area on said touch-sensitive display, said key area corresponding to an entry of data by a player, wherein said control means is responsive to said first key area for receiving and storing said player data.

# **ABSTRACT**

The invention provides a video gaming machine (10) having a touch screen display (12) and a control system which displays game control touch areas and player data input (78) and message areas (76) on the touch screen display (12) to  
5 integrate game control and player tracking functions. The data input areas (78) include touch sensitive key areas (88) for inputting alphanumeric information. The message areas (76) can include both alphanumeric text and graphics messages. The control system groups the message (76) and data input key areas (78) in a logical fashion to create a user-friendly graphical interface to the gaming machine data  
10 system. In another aspect of the present invention, a second group of key areas (80) is provided which display graphical icons (82a-e) representing services available to the player.

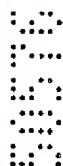
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AUSTRALIA

*Patents Act 1990*

**COMPLETE SPECIFICATION  
FOR A STANDARD PATENT**

**ORIGINAL**



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Invention Title: **VIDEO GAMING MACHINE HAVING A TOUCH  
SCREEN FOR PLAYER INTERACTION**

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The following statement is a full description of this invention, including the best method of performing it known to us

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## VIDEO GAMING MACHINE HAVING A TOUCH SCREEN FOR PLAYER INTERACTION

### Field of the Invention

The invention relates to video gaming machine systems, and in particular to video gaming machine systems employing a touch screen device that provides integrated game and gaming machine control through player interaction.

### Background of the Invention

Video gaming machines are widely used in casinos and other gaming locations. Unlike more traditional gaming machines such as slot machines, video gaming machines employ a computer-like CRT display, which provides text and high-resolution graphics making game play more exciting and enjoyable. Because its display is computer controlled, a video gaming machine is highly flexible and can be programmed to display many different kinds of games on a single machine. In addition, a video gaming machine can be equipped with a touch screen video display, which makes the game easier to play and further enhances player satisfaction. An example of a video

gaming machine equipped with a touch screen video display is provided by U.S. Patent No. 5,342,047.

Computer technology has made possible a number of significant advancements in gaming machines. In many gaming locations, for example, gaming machines are equipped with a data collection/monitoring system ("data system"), which can be a single processor or several computers linked by a communication line. The data system provides, among other things, accounting data, security and "player tracking", wherein the data system tracks total wagering activity for each player so that frequent activity can be rewarded with promotional gifts, such as free meals and free rooms at a hotel casino, similar to airline frequent flyer promotions.

Data systems that provide player tracking must be equipped with a means for identifying individual players. One way this is accomplished is by connecting card readers to the data system. The card reader can accept a data card furnished by the casino operator that contains a unique identifier for each player. In addition, the card reader may accept commercial credit cards, or other data cards associated with a player credit account, which allow players to purchase game credit and casino services without using cash. Typically, the data systems that are linked to individual gaming machines perform the security and verification procedures required to use these data cards for such purchases. For this purpose, data systems are often connected to a central host computer that has a player account database. A more detailed description of a gaming machine data system is provided in U.S. Patent No. 5,429,361.

Usually, existing gaming machines must be retrofitted with a "systems box" to add data card capability. A systems box is a device having a card reader, an LCD, LED or vacuum florescent display and a keypad, which is used to enter numeric data. To use a data card with a systems box, the player inserts the card into the card reader and selects the desired transaction. If the player wishes to purchase game credit for wagering, the systems box display prompts the player to enter the amount of game credit to be purchased. As directed by the display, the player enters a player account number and password (i.e., a personal identification number). In some installations, the keypad buttons can also be used to request casino services such as drinks, change or machine service. Typically, the systems box is connected via a communication line to a data system, which authorizes the desired transaction by verifying the personal identification number and purchase amount against the player's account.

Typical systems boxes share a number of significant disadvantages. For example, systems boxes are often installed on the side or the top of the gaming machine. This orientation is inconvenient for the player and makes it more difficult to interact with the gaming machine and the systems box simultaneously. Although systems boxes can be incorporated into the "feature glass" area of the gaming machine, this placement increases the dimensions of the gaming machine. Moreover, a typical systems box display is limited to only 16 to 20 alphanumeric characters in length, which is capable of displaying only cryptic messages making player interaction inconvenient and difficult. In addition, the keypad size is limited such that the keypad buttons are typically inconveniently sized. To date, gaming machines have not made use of the display and

communication capabilities provided by video gaming machine technology to facilitate the use of data cards or other non-cash instruments with the gaming machine.

Therefore, there is a need for a video gaming machine which integrates game play and traditional data systems functions using the same video gaming machine hardware. Moreover, it would be highly desirable to provide a more convenient method of using a data card, or other non-cash mechanism, for placing wagers on the gaming machine and accessing other casino services.

#### Summary of the Invention

10 The principal object of this invention is to provide an improved video gaming machine that overcomes the limitations of the prior art. More specifically, the present invention provides a video gaming machine controller that uses the gaming machine's touch screen display and communication facilities to provide a more convenient and simplified method for providing data systems features to  
15 players of the gaming machine.

According to a first aspect of the invention, there is provided a video gaming machine comprising:

a touch-sensitive video display; and  
control means operatively connected to said touch-sensitive video display for  
20 displaying a game and for displaying a message area and a first touch-sensitive key area on said touch-sensitive display, said key area providing for entry of player data by a player, wherein said control means is responsive to said first key area for receiving and storing said player data.

According to a second aspect of the invention, there is provided a video  
25 gaming machine comprising:

a housing;  
a touch-sensitive video display mounted within said housing; and  
control means connected to said touch-sensitive display comprising a game memory and a control memory, said game memory for causing said touch-sensitive  
30 display to display a game, wherein said game includes displays of game control touch areas for playing said game and said control memory for causing said touch-sensitive display to display machine control touch areas for operating the machine;





wherein said control means further comprises means for displaying on said touch-sensitive display a sign-on screen having touch-sensitive key areas through which a player enters a player identifier.

Conveniently, the machine displays digital information to the player solely  
5 on the touch-sensitive video display.

Accordingly to another aspect of the invention, there is provided a video gaming machine for displaying a game and messages, comprising:

a touch-sensitive video display; and

control means operatively connected to said touch-sensitive video display for  
10 displaying the game and for displaying a message area and a first touch-sensitive key area on said touch-sensitive display, said key area providing for entry of player data by a player, wherein said control means is responsive to said first key area for receiving and storing said player data;

wherein all digital information forming the game and the messages is  
15 displayed to the player on said touch-sensitive video display.

According to a further aspect of the invention, there is provided a video gaming machine, comprising:

a housing;

a touch-sensitive video display mounted within said housing; and

20 control means connected to said touch-sensitive display comprising a game memory and a control memory, said game memory for causing said touch-sensitive display to display a game, wherein said game includes displays of game control touch areas for playing said game and said control memory for causing said touch-sensitive display to display machine control touch areas for operating the machine;

25 wherein said control means further comprises means for displaying on said touch-sensitive display a sign-on screen having touch-sensitive key areas through which a player enters a player identifier; and

wherein all digital information forming the game and the machine control touch areas is displayed to the player on said touch-sensitive video display.



In one embodiment of the present invention, the touch screen controller, driven by the CPU of the video gaming machine, generates a multi-area sign-on screen when a player initiates a transaction with the gaming machine. The sign-on screen includes a message area, a touch-sensitive keypad or data entry area and a  
 5    general "service area", which may contain icons representing a variety of services that can be ordered by the player. The sign-on screen and/or individual message or key areas can be displayed when desired or convenient, for example, when a player inserts a data card in a card reader. In an alternative embodiment, the controller  
 10    displays a menu bar marking the location of a series of touch-sensitive "pull down menus" which contain available selections for transactions or casino services.

The present invention provides a significantly more user-friendly environment than that provided by systems boxes. The user interface is capable of displaying detailed messages and instructions for the player, making the machine  
 15    easier and less frustrating to use. Ease of use is further enhanced by the use of graphics, including icons. Moreover, the use of touch-sensitive key areas for both video game control buttons and machine control buttons provides a more natural and less cryptic method of interacting with the video gaming machine. Finally, because the touch screen display of the video gaming machine incorporates both the  
 20    display and keypad functions of a typical systems box, only a card reader need be installed to give the gaming machine data card capabilities. As a result, the gaming machine is smaller and less



expensive to build than prior gaming machines that must be retrofitted with systems boxes.

Other objects and features of the invention will be apparent from the following description and from the drawings.

5      Brief Description of the Drawings

FIG. 1 is a perspective view of a video gaming machine employing a touch screen;

FIG. 2 is a functional block diagram of the control system for a video gaming machine in accordance with this invention; and

FIG. 3 is a screen display showing a sign-on screen that can be used to initiate contact with a video gaming machine.

10      Detailed Description of the Invention

15      Illustrated in FIG. 1 is an example of a video gaming machine terminal 10 having a touch screen display 12 secured within a housing 14. Also secured within housing 14 are a plurality of game control buttons 16a-16e, which may be, for example, "hold buttons" used in playing video poker. Housing 14 may also contain other control buttons including a "collect" button 18, a "bet one" button 20, a "max bet" button 22, and a "deal/draw" button 24. Because video gaming machine 10 employs a touch screen display, these game control buttons can also be included on the display of the video  
20      game itself. Where gaming machine 10 is capable of displaying a variety of different

video games (e.g., a video lottery terminal), touch screen 12 may contain a touch-sensitive menu display (not shown) listing the game choices available to the player for selection.

Video gaming machine 10 also includes several means for accepting various forms of monetary value for wagering. For example, video gaming machine 10 includes a coin acceptor 26 and a bill acceptor 28. Also included is a data card reader 30, which can accept player credit account cards or player identifier cards for player tracking. For dispensing game wins or accumulated game credit, video gaming machine 10 includes a coin tray 22, which dispenses coins from a coin hopper (not shown) housed within gaming machine 10. Alternatively, a ticket printer (not shown) can be installed in video gaming machine 10 to print coupons having an equivalent cash value. The general construction of video gaming machine 10 is in accordance with the video lottery terminal described in U.S. Patent No. 5,342,047 issued to Heidel, et al., owned by the assignee of the present invention, the disclosure of which is hereby incorporated by reference into the present application.

Fig. 2 is a block diagram of a control circuit in conformance with the present invention. A gaming machine CPU 34, which can be a microprocessor or single board computer, is used to control operation of the video gaming machine 10. A memory 36, such as an EPROM, is connected to CPU 34 by line 38. Memory 36 contains both machine control programs 40 and a set of game control programs 42. Coin acceptor 26, bill acceptor 28 and card reader 30 are also connected to CPU 34 via lines

44, 46 and 48, respectively. For outputting coin to the player, CPU 34 is connected to a coin hopper 50 via control line 52.

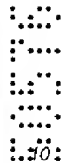
The touch screen display 12 is connected via a line 54 to a video display controller 56, which is connected to CPU 34 by a line 58. The touch screen display 12 includes a control circuit 60, which is connected to CPU 34 by line 62. Controller 60 generates a signal on line 62 representing the location on the screen 12 that has been touched by a player. In addition to responding to input from touch areas on display 12, CPU 34 can accept control input from control buttons 84 via communication line 86.

CPU 34 is also programmed to perform the functions typically provided by a data monitoring/collection system ("data system"). Accordingly, CPU 34 can be connected by communication line 72 to a central or host computer 68 via network interface 70. Host computer 68 may be a personal computer, for example, an IBM RT class or compatible, or a mini-computer such as a DEC 1184 or IBM RISC 6000, depending on the size of the installation and the number of gaming machines to which it is attached. Host computer 68 can have a data base for storing player account data and archiving accounting and other information compiled and transmitted by CPU 34.

In accordance with the present invention, touch screen display 12 of video gaming machine 10 provides data input and output to CPU 34 to facilitate player interaction and provide data system features. Through touch screen controller 60 and video display controller 56, CPU 34 generates touch-sensitive key areas for player input and message areas for outputting useful information to the player on touch screen display

12. Using the communication facilities of gaming machine 10, including communication lines 58 and 62 between CPU 34 and video controller 56 and touch screen controller 60, respectively, data input by the player via the touch-sensitive key areas is transmitted to CPU 34 and data output from CPU 34 is transmitted to message areas on display 12.

5 Advantageously, the video touch screen display 12 is fully programmable by the gaming machine CPU 34, which organizes message and key areas to provide a highly flexible and informative user interface to data system 64. In addition, because CPU 34 uses the touch screen display 12 and communication facilities of video gaming machine 10, no external data system or "systems box" is required, significantly reducing the size and the cost of the gaming machine.



In the preferred embodiment, video game CPU 34 generates a sign-on screen 74 to initiate player interaction. This can occur, for example, when the player inserts a data card into card reader 30 or when the player touches an appropriately labeled key area on display 12. As illustrated in FIG. 3, the sign-on screen 74 includes a message area 76 which provides useful information and instructions to the player, touch-sensitive data input key areas 78 for accepting numeric and alphanumeric input from the player and a service request area 80 which contains a number of "soft keys" 82a-e through which a player can order drinks, report gaming machine malfunctions, request change or add or save game credit. To aid in player acceptance, key area 78 can mimic the faceplate of a systems box, including both a keypad area 88 and a display window 90. However, because the size of keypad 88 and display 90 is fully programmable, the individual keys can be large enough to permit convenient use.

In an alternative embodiment, a menu bar containing a series of "pull down" (not shown) menus can be displayed at the top of the touch screen display. The player can pull down a menu for a desired category of functions by touching the appropriate area on the menu bar. Next, the player selects the menu item corresponding to the desired service or function simply by touching the appropriate area within the pull down menu.

In conjunction with input key areas 78 and message areas 76, CPU 34 can provide a means by which game credit, or casino services, can be purchased by a player using a data card or other non-cash instrument. When a player inserts a data card within card reader 30, CPU 34 displays sign-on screen 74. The player then enters his Personal Identification Number ("PIN") and other information, such as the amount of the transaction, on keypad 88. This data is transmitted to CPU 34 via line 62. Next, CPU 34 verifies the requested transaction with host computer 68 (or with a financial institution if a commercial credit card is being used). If a correct PIN and a valid amount have been entered, CPU 34 authorizes gaming machine 10 to proceed with the transaction.

Integrating game control functions with gaming machine control and transaction features represents a significant improvement over the limited capabilities of a typical "systems box." For example, video gaming machine 10 can display high-resolution graphics, along with text, which make interaction with the machine easier and more enjoyable. In addition, unlike the display of most systems boxes, the message area 76 of touch screen display 12 is not limited to 16 or 20 alphanumeric characters. As

a result, detailed instructions can be displayed, reducing the possibility of ambiguity, along with useful and interesting information, such as player statistics, making the game more interesting.

In addition, because video display 12 is under the control of a microprocessor, i.e., CPU 34, the system has enhanced flexibility. For example, at a touch of a suitable area (not shown) on the screen 12, service request key area 80 can be displayed, from which the player can order casino services or request change without interrupting game play. Because all of the game control buttons and gaming machine control buttons appear on the same display, the player need not look away from the video display to request services or initiate data card transactions. All of these advantages facilitate game play and, therefore, increase the value of the gaming machine to its owner.

A specific embodiment of the invention for use with gaming machines in a casino has been described for purposes of illustrating the manner in which the system may be used. It should be understood that implementation of other variations and modifications of the invention and its various aspects will be apparent to those skilled in the art, and that the invention is not limited to the specific embodiments described. It is therefore contemplated to cover by the present invention any and all modifications, variations and equivalents that fall within the true scope and spirit of the basic underlying principles disclosed and claimed herein.



## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A video gaming machine comprising:  
a touch-sensitive video display; and  
control means operatively connected to said touch-sensitive video display for  
5 displaying a game and for displaying a message area and a first touch-sensitive key  
area on said touch-sensitive display, said key area providing for entry of player data  
by a player, wherein said control means is responsive to said first key area for  
receiving and storing said player data.
2. The video gaming machine according to claim 1 wherein said player data  
10 entered by said player includes a player identifier and said control means further  
comprises means for storing and updating information based upon the total  
wagering and payout activity corresponding to said player identifier.
3. The video gaming machine according to claim 2 wherein said first key area  
15 comprises a display window and keypad having touch-sensitive buttons  
corresponding to digits for entering said player identifier.
4. The video gaming machine according to claim 2 or claim 3 further  
comprising credit means connected to said control means for providing a credit  
balance to said video gaming machine from an account associated with the player  
by said player identifier.
- 20 5. The video gaming machine according to claim 4 wherein said control means  
further comprises means for receiving said player identifier and said credit balance  
and verifying that said identifier and said credit balance correspond to said player  
account.
6. The video gaming machine according to any one of the previous claims  
25 wherein said message area on said touch-sensitive display includes an area for  
displaying text messages and an area for displaying graphics messages to the player.
7. The video gaming machine according to claim 4 or claim 5 wherein said  
control means further comprises means for displaying a second key area on said  
touch-sensitive display for requesting various services including services available  
30 for purchase by the player from said player account.



8. The video gaming machine according to claim 7 wherein said second key area comprises a plurality of touch-sensitive buttons having icons representing various services available to the player.

9. The video gaming machine according to either claim 5 or 7 wherein said credit means comprises a data card reader having an interface for reading from and writing to a data card, wherein said data card has a memory for storing a player identifier and an account number and wherein said control means verifies that the player identifier entered by the player matches the player identifier stored on said data card.

10. The video gaming machine according to claim 9 further comprising a remote computer system operatively connected to said control means having a memory for storing said player account, wherein said control means transmits said player identifier and said credit balance to said remote computer system for verification against said player account.

11. The video gaming machine according to claim 10 further comprising means for deducting said credit balance from said player account.

12. The video gaming machine according to claim 4 wherein said credit means comprises a data card reader having an interface for reading from and writing to a data card, wherein said data card has a memory for storing an account balance corresponding to said player account.

13. The video gaming machine according to claim 4 further comprising second control means operatively connected to said control means for receiving said player identifier and said credit balance and verifying that said identifier and said credit balance correspond to said player account.

14. The video gaming machine according to claim 13 wherein said credit means comprises a data card reader having an interface for reading from and writing to a data card, wherein said data card has a memory for storing said player identifier and an account number and wherein said second control means verifies that the player identifier entered by said player matches said player identifier stored on said data card.

15. The video gaming machine according to claim 13 further comprising a remote computer system operatively connected to said second control means having



a memory for storing said player account, wherein said second control means transmits said player identifier and said credit balance to said remote computer system for verification against said player account.

16. The video gaming machine according to claim 15 further comprising means  
5 for deducting said credit balance from said player account.

17. The video gaming machine according to claim 1 wherein said control means further comprises means for displaying a second touch-sensitive key area corresponding to control buttons for controlling the activity of said games displayed on said touch-sensitive video display and having means responsive to said  
10 touch-sensitive display for causing activity to occur in said games.

18. The video gaming machine according to claim 1 wherein said first key area comprises a display window and keypad having touch-sensitive buttons corresponding to digits for entering numeric information.

19. The video gaming machine according to claim 1 wherein said message area  
15 on said touch-sensitive display includes an area for displaying text messages and an area for displaying graphics messages to the player.

20. The video gaming machine according to claim 1 wherein said control means further comprises means for displaying a second key area on said touch-sensitive display for requesting various services available to the player.

21. The video gaming machine according to claim 20 wherein said second key  
20 area comprises a plurality of touch-sensitive buttons having icons representing various services available to the player.

22. The video gaming machine according to any one of the preceding claims wherein the machine displays digital information to the player solely on said touch-  
25 sensitive video display.

23. A video gaming machine comprising:

a housing;

a touch-sensitive video display mounted within said housing; and

control means connected to said touch-sensitive display comprising a game  
30 memory and a control memory, said game memory for causing said touch-sensitive display to display a game, wherein said game includes displays of game control



touch areas for playing said game and said control memory for causing said touch-sensitive display to display machine control touch areas for operating the machine;

wherein said control means further comprises means for displaying on said touch-sensitive display a sign-on screen having touch-sensitive key areas through  
5 which a player enters a player identifier.

24. The video gaming machine according to claim 23 wherein said control means further comprises means for storing and updating information based upon total wagering and payout activity corresponding to said player identifier.

25. The video gaming machine according to claim 23 or claim 24 further  
10 comprising credit means connected to said control means for providing a credit balance to said video gaming machine from an account associated with the player by said player identifier.

26. The video gaming machine according to claim 25 wherein said sign-on  
15 screen further comprises key areas through which a player enters said credit balance and said control means further comprises means for receiving said player identifier and said credit balance and verifying that said identifier and said credit balance correspond to said player account.

27. The video gaming machine according to claim 26 wherein said credit means  
20 comprises a data card reader mounted within said housing having an interface for reading from and writing to a data card, wherein said data card has a memory for storing a player identifier and wherein said control means verifies that the player identifier entered by the player matches said player identifier stored on the data card.

28. The video gaming machine according to claim 27 further comprising a  
25 remote computer system operatively connected to said control means having a memory for storing said player account, wherein said control means transmits said player identifier and said credit balance to said remote computer system for verification against said player account.

29. The video gaming machine according to claim 28 further comprising means  
30 for deducting said credit balance from said player account.

30. The video gaming machine according to claim 25 wherein said credit means comprises a data card reader mounted within said housing having an interface for



reading from and writing to a data card, wherein said data card has a memory for storing an account balance corresponding to said player account.

31. The video gaming machine according to claim 23 further comprising second control means operatively connected to said control means for receiving said player identifier from said control means and storing and updating information based upon total wagering and payout activity corresponding to said player identifier.

32. The video gaming machine according to claim 31 further comprising credit means connected to said second control means for providing a credit balance to said video gaming machine from an account associated with the player by said player identifier.

33. The video gaming machine according to claim 32 wherein said sign-on screen further comprises key areas through which a player enters said credit balance and said second control means further comprises means for receiving said credit balance and for verifying that said identifier and said credit balance correspond to said player account.

34. The video gaming machine according to claim 33 wherein said credit means comprises a data card reader mounted within said housing having an interface for reading from and writing to a data card, wherein said data card has a memory for storing said player identifier and an account number and wherein said second control means verifies that the player identifier entered by the player matches said player identifier stored on the data card.

35. The video gaming machine according to claim 34 further comprising a remote computer system operatively connected to said second control means having a memory for storing said player account, wherein said second control means transmits said player identifier and said credit balance to said remote computer system for verification against said player account.

36. The video gaming machine according to claim 35 further comprising means for deducting said credit balance from said player account.

37. The video gaming machine according to any one of claims 23 to 36 wherein the machine displays digital information to the player solely on said touch-sensitive video display.



38. A video gaming machine for displaying a game and messages, comprising:  
a touch-sensitive video display; and

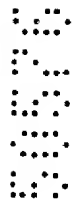
control means operatively connected to said touch-sensitive video display for displaying the game and for displaying a message area and a first touch-sensitive  
5 key area on said touch-sensitive display, said key area providing for entry of player data by a player, wherein said control means is responsive to said first key area for receiving and storing said player data;

wherein all digital information forming the game and the messages is displayed to the player on said touch-sensitive video display.

10 39. A video gaming machine, comprising:

a housing;

a touch-sensitive video display mounted within said housing; and



control means connected to said touch-sensitive display comprising a game memory and a control memory, said game memory for causing said touch-sensitive  
15 display to display a game, wherein said game includes displays of game control touch areas for playing said game and said control memory for causing said touch-sensitive display to display machine control touch areas for operating the machine;



wherein said control means further comprises means for displaying on said touch-sensitive display a sign-on screen having touch-sensitive key areas through  
20 which a player enters a player identifier; and



wherein all digital information forming the game and the machine control touch areas is displayed to the player on said touch-sensitive video display.

40. A video gaming machine substantially as hereinbefore described with reference to the accompanying drawings.

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FIG. 1

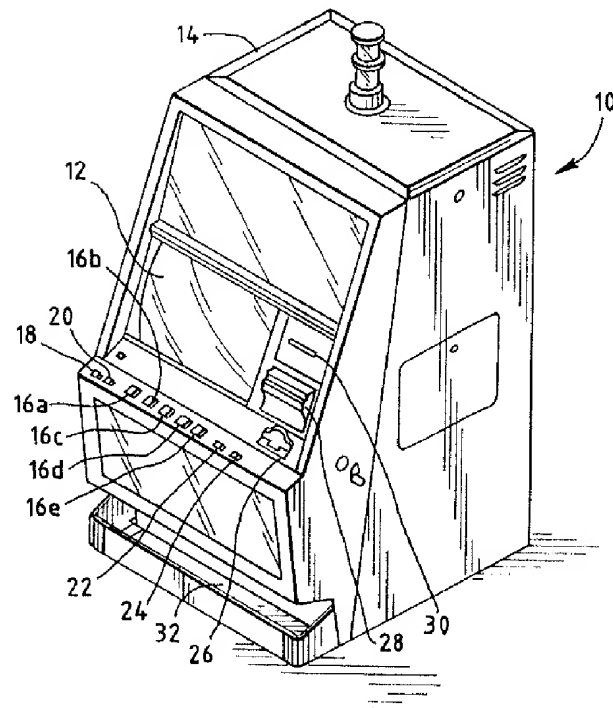


FIG. 2

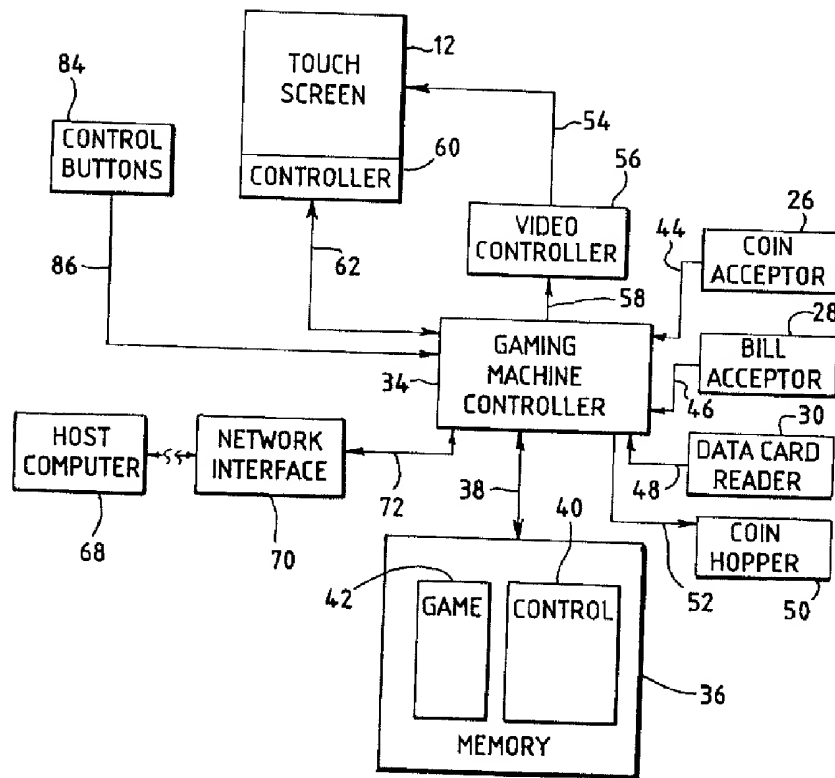




FIG. 3

